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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,568	11/26/2001	Yong Soo Cho	11014-003	1575

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EXAMINER

JONES, PRENELL P

ART UNIT PAPER NUMBER

2667

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/994,568

**Applicant(s)**

CHO ET AL.

**Examiner**

Prenell P. Jones

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/26/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-39 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 2-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/26/01.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### ***Claim Objections***

1. Claims 5, 13 and 14 are objected to because of the following informalities:

Regarding claim 5, in line 3, 5 and 7, Applicant is claiming "sub-module 310", "de-multiplexer 330," and "adder 340" respectively; regarding claim 13, in line 2 and 6, Applicant is claiming "sub-module 600", "de-multiplexer 620," respectively, and regarding claim 14, in line 3, 5 and 9, Applicant is claiming "controller 621", "de-multiplexer 330," and "multiplier 623" respectively, whereby the numeral identifier is not a positive limitation. Claims 6-12 and 15-17 depend on claims 5 and 14 respectively, so claims 6-12 and 15-17 are objected to as well. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Beale.

Regarding claim 1, Kobayashi discloses demodulation associated with wireless OFDM wherein the architecture includes (Abstract, Fig. 2, page 1388, left column thru page 1390 left column) the indirect or direct coupling of A/D converter, frequency synchronization, FFT, channel estimation, equalizer, estimation of phase rotation (phase tracking), wherein residual frequency is monitored, and symbol timing is coupled between frequency synchronization and FFT, which indicates that there exist some kind of control function utilized. Kobayashi is silent on a controller coupled to frequency synchronization. In a frequency synchronization network associated with OFDM communications, Beale discloses (Abstract, col. 2, line 54 thru col. 3, line 21, line 43-46, col. 8, line 48-49, col. 9, line 58-60, col. 10, line 8-15, line 44-45) a frequency controller (AFC) synchronization network, wherein controller functions are associated with frequency synchronization (controller coupled to frequency sync), and tracking algorithms are utilized. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to be motivated to implement a controller coupled to a frequency synchronization module as taught by Beale with the teachings of Kobayashi

for the purpose of further managing and controlling the operations of the synchronization network.

***Allowable Subject Matter***

5. Claims 18-39 are allowed.
6. Claims 2-17 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Although the combined prior art discloses a wireless OFDM wherein the architecture includes the indirect or direct coupling of A/D converter, frequency synchronization, FFT, channel estimation, equalizer, estimation of phase rotation wherein residual frequency is monitored, and a control function associated with frequency synchronization, they fail to teach or suggest compensating the data symbol of the input signal with the frequency offset estimated, which is associated with the step of compensating the frequency of the training signal, and compensating the data symbol with the estimating channel of a transformed frequency, received signals contain long and short training signals, estimate the frequency offset of short training signal to compensate the long training signal with the frequency offset of the short training signal in a coarse mode and re-compensate long training signal in a fine mode, a second demultiplexer for selectively outputting compensated signal from the frequency offset compensation sub-module, residual phase tracking sub-module including a pilot

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extractor, a second region controller for outputting a second log function table address corresponding to a residual phase value from a first de-multiplexer, and a second log function table for outputting a previously stored log function value corresponding to a log function table address from the second region controller.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prenell P. Jones whose telephone number is 571-272-3180. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Prenell P. Jones

June 25, 2005



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6/27/05